

REMARKS

Claims 1-41 are cancelled. Claims 42, 44, 45, 50, 53, 54, 56, 58, and 59 are amended. New Claims 61-75 have been added. Hence, claims 42-75 are now active and under consideration in this case.

Applicant wishes to thank Examiner Clardy for the recent helpful and courteous discussion conducted with his representative, Mr. William E. Beaumont. Further to the remarks made during the discussion, Applicant wishes to make the following additional remarks.

The claimed invention pertains to a ready-to-use macronutrient- and/or micronutrient-adjusting composition for correcting deficiencies thereof in a medium for growing plants, as well as a methods of making and using the composition.

At the outset, it is noted that the claimed composition is generally used by itself in correcting the macronutrient- and/or micronutrient deficiencies in media for growing plants. As will be explained below and in the attached Rule 132 Declaration, many conventional fertilizer systems are, in fact, incompatible with the claimed composition. Generally, additional fertilizers need not be used with the claimed composition as the claimed composition may be designed to provide all essential plant nutrients in a solution stable state. See Example 4 of the present specification, for example. Thus, additional fertilizers are generally unnecessary when using the claimed composition.

However, many conventional fertilizers cannot be mixed with the claimed composition due to the adverse chemical reactions which occur. An example of such an

adverse-reacting conventional fertilizer is that of Woodhouse. This will be explained below.

Claims 27, 28, 31-33, 36-38 and 41 stand rejected under 35 USC. §103 (a) as being anticipated by Woodhouse (U.S. 2,237,826) and Kirk-Othmer.

However, Woodhouse fails to either disclose or suggest the subject matter of claims 27, 28, 31-33, 36-38 and 41.

As noted previously, Woodhouse merely describes the incorporation of sulfamic acid (or the ammonium salt thereof) into nitrogen-containing or ammoniating liquors in order to adjust the ratio of fixed to free ammonia to be varied over a wide range. Col. 2, lines 30-34. Further, while Examples 1 and 2 at col. 4, lines 60-75 describe the direct addition of ammonium sulfamate, it is equally clear that addition of free sulfamic acid to the ammoniating or nitrifying solutions described in Woodhouse (See Col. 2, lines 41-55) would neutralize sulfamic acid by formation of the ammonium salt as Woodhouse describes the ammoniating or nitrifying solutions as:

. . . containing both inorganic and organic ammonia. Col. 2, lines 51 -52.

Clearly, one skilled in the art would expect formation of ammonium sulfamate in an acid-base reaction as noted previously.

In contrast, the subject matter of claims 42-75 entails the use of (for methods) or inclusion of (for a composition) a reaction product consisting essentially of a reaction product of one or more sulfamic acid compounds and a substantially water-insoluble second compound containing macronutrient and/or micronutrient moieties.

Clearly, one skilled in the art would not be motivated to either make or use the subject matter of present claims 42-75. In fact, Woodhouse clearly teaches away from the subject matter of claims 42-75 for several reasons.

First, the entire point of Woodhouse in adding free sulfamic acid into nitrogen-containing or ammoniating liquors is to adjust the ratio of fixed to free ammonia to be varied over a wide range. See the previous discussion above.

Second, according to Woodhouse, ammonium sulfamate may be either formed *in situ* or added directly. For example, as noted above, Examples 1 and 2 of Woodhouse describe the addition of ammonium sulfamate to the nitrogen-containing or ammoniating liquors. Thus, the sulfamic acid “salt” of Woodhouse may be ammonium sulfamate either added directly or formed *in situ*. Clearly, one skilled in the art would be taught away from using the nitrifying- or ammoniating liquors of Woodhouse as any free sulfamic acid would be converted to ammonium sulfamate.

Further, in the highly alkaline environment of the Woodhouse composition, the nitrifying- and/or ammoniating liquors of Woodhouse would either neutralize any free sulfamic acid or cause displacement of any metal cations bonded to sulfamic acid by ammonium cations.

Clearly, in view of all of the above, one skilled in the art would have recognized that the Woodhouse fertilizer is chemically incompatible with the presently claimed composition and would be taught away from the present invention by Woodhouse.

Kirk-Othmer fails to correct the deficiencies of Woodhouse as the former merely discloses sulfamic acid and metal salts thereof. However, this reference is not analogous

art with Woodhouse as Kirk-Othmer is completely unrelated to any soil-treating composition.

Further, inasmuch as the present ready-to-use composition is formulated in view of previously determined deficiencies in the plant growth medium, once the composition containing the claimed reaction product is prepared, it would be clearly disadvantageous to displace any metals in the reaction product with ammonium as this would preclude the ready-to-use composition from remedying the deficiencies.

Further, attached herewith is the executed Rule 132 Declaration of Cheng Wu.

The attached Rule 132 Declaration of Cheng Wu explains why one skilled in the art would find that Woodhouse teaches away from the present invention. First, as noted above the ammoniating- or nitrifying liquors of Woodhouse would be quite chemically adverse to the present invention for reasons relating to metal displacement and subsequent precipitation.

Second, the Declaration explains that, in fact, it is either unnecessary or detrimental or both to use additional conventional fertilizers with the present ready-to-use composition.

In particular, the “reaction product” of the present invention will, in the presence of sulfates, such as calcium sulfate (gypsum) provoke metal displacement and precipitation. In displacement reactions, such as a single displacement reaction, the more active element or cation displaces the less active element or cation.

Thus, in the presence of the ammoniating liquor of Woodhouse, the use of any metallic sulfamate salts would result in the formation of ammonium sulfamate with

release of the displaced metal cation into solution. This would fundamentally alter the “reaction product” of the present invention as it would be devoid of the displaced metal which was presumably required to rectify any previously measured soil deficiencies.

Further, sulfates and phosphates are common ingredients of conventional fertilizers. However, these “additives” are incompatible with the present metallic sulfamate “reaction product.” Specifically, precipitation will occur rapidly, i.e., within hours, if not minutes, if phosphates are added to the present “reaction product.” Notably, if iron (Fe) is bound to the “reaction product” of the present invention, in the presence of a phosphate, iron phosphate (having a K_{sp} value of 9.91×10^{-16} , i.e., highly insoluble) will readily precipitate. See the K_{sp} value attached to and incorporated into the Declaration.

Also attached to and incorporated into the Rule 132 Declaration of Cheng Wu is an Exhibit entitled, “How To Turn Agro 575 Into Another NPK Ratio.” This evidences how software may be used to formulate a composition which precisely provides what a given crop demands. Thus, there is no need to use additional conventional fertilizers in conjunction with the claimed composition. Moreover, in addition to the adverse chemical reactivity of many conventional fertilizers with the present composition, the addition of conventional fertilizers to the present composition provides two further problems:

1. It wastes fertilizer (as addition of fertilizer is unnecessary), and
2. It pollutes the environment.

Furthermore, free metals are useless in the fertilizer industry as free metals are easily and readily bound by sulfates and phosphates, i.e., gypsum and iron phosphate, for

example. In fact, sulfates and phosphates readily displace metals from sulfamates, i.e., in less than 1 hour at any pH, and phosphates with or without sulfates will provoke precipitation of displaced metal. Hence, sulfates, phosphates and sulfamates are chemically incompatible for purposes of the claimed invention.

In the micronutrient industry, free metals are chelated by chelating compounds, such as EDTA, DTPA, EDDHA, amino acids, citric acid, glucoheptonate or mannitol, for example, for use in fertilizers. One advantage of the present invention is that the claimed “reaction product” effectively sequesters metals without the need for added organic chelating compounds, such as those mentioned above.

All of the above further illustrates that the present composition is a self-contained macronutrient- and/or micronutrient adjusting composition which need not, and in many cases cannot be, used with other conventional fertilizer compositions.

The Examiner has opined that the terms “plant growth promoting amount” for each of nutrients and water could refer to any amount. See page 4 of the Official Action.

However, attached to and incorporated into the Declaration provided herewith is a Table from Horst Marschner’s “Mineral Nutrition of Higher Plants.” In essence, known average concentrations of mineral nutrients in plant shoot dry matter are provided which are sufficient for growth. While these values are known, it is noted that they vary considerably depending on plant species, plant age and concentration of other mineral elements. Thus, the term “plant growth promoting amount” is not simply any amount, but an amount which will result from determinations taking the above factors and sources like Marschner into account.

Similarly, an appropriate amount of water will be based upon known factors such as soil aridity, for example, which may also vary. Hence, these terms are considered to be both meaningful and appropriate.

Finally, it is urged that the claim language of independent claims 42, 51 and 56, i.e., -- consists essentially of -- excludes the nitrifying- and ammoniating liquors of Woodhouse as those liquors would react with sulfamic acid to form ammonium sulfamate, which would “materially affect” the present invention as noted above, and in an adverse manner. It is well settled that inclusion of -- consisting essentially of -- excludes constituents that would materially affect a claimed composition if included therein. See *In re Garnero*, 162 USPQ 221 (CCPA 1969). The attached Rule 132 Declaration of Cheng Wu well explains why the use of Woodhouse fertilizer with the claimed composition would be detrimental, and that the two compositions are, in fact, incompatible.

Accordingly, in view of all of the above, it is believed that this application is now in condition for allowance. Early notice to this effect is earnestly solicited.

If necessary, please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 13-2527 and please credit any excess fees to such deposit account.

CONCLUSION

In view of the above amendments and remarks, Applicants respectfully urge that this application is now in condition for allowance. Early notice to this effect is earnestly solicited. If the Examiner believes a telephone conference would advance the

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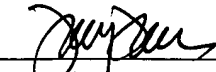
prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

MERCHANT & GOULD P.C.

July 30, 2006

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